

PATENT COOPERATION TREATY

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NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner
US Department of Commerce
United States Patent and Trademark
Office, PCT
2011 South Clark Place Room
CP2/5C24
Arlington, VA 22202
ETATS-UNIS D'AMERIQUE
in its capacity as elected Office

Date of mailing:

01 March 2001 (01.03.01)

International application No.:

PCT/EP00/05707

Applicant's or agent's file reference:

M.COSTA 9-9

International filing date:

20 June 2000 (20.06.00)

Priority date:

20 August 1999 (20.08.99)

Applicant:

COSTA, Mauro et al

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International preliminary Examining Authority on:

11 November 2000 (11.11.00)

☐ in a notice effecting later election filed with the International Bureau on:2. The election ☒ was☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer:

J. Zahra

Telephone No.: (41-22) 338.83.38

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INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference M.COSTA 9-9	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/EP 00/ 05707	International filing date (day/month/year) 20/06/2000	(Earliest) Priority Date (day/month/year) 20/08/1999
Applicant LUCENT TECHNOLOGIES INC.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

1

☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No

P 00/05707

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 H04Q7/38

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04Q H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, INSPEC, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 2 315 193 A (ORANGE PERSONAL COMM SERV LTD) 21 January 1998 (1998-01-21) page 6, paragraph 2 -page 7, paragraph 2 page 11, line 16 - line 19 page 14, paragraph 3 page 20, line 4 - line 20 page 29, line 20 -page 30, line 7 ---	1-9
A	WO 94 06219 A (NOKIA TELECOMMUNICATIONS OY ;KAUPPI HANNA MARIA (FI)) 17 March 1994 (1994-03-17) page 1, paragraph 1 -page 3, paragraph 2 page 4, line 26 - line 31 --- -/--	1-9



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *G* document member of the same patent family

Date of the actual completion of the international search

21 November 2000

Date of mailing of the international search report

29/11/2000

Name and mailing address of the ISA

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Authorized officer

Blanco Cardona, P

INTERNATIONAL SEARCH REPORT

International Application No

PCT/JP 00/05707

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>WO 98 37721 A (NOKIA TELECOMMUNICATIONS OY ; SOEDERBACKA LAURI (FI); EINOLA HEIKKI) 27 August 1998 (1998-08-27) abstract page 2, paragraph 2 -page 3, paragraph 3 page 11, paragraph 3 -page 13, paragraph 1 -----</p>	1-9

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

P 00/05707

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
GB 2315193	A	21-01-1998	AU	1608997 A		02-02-1998
			EP	0910924 A		28-04-1999
			WO	9802008 A		15-01-1998
			ZA	9705864 A		25-01-1999
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WO 9406219	A	17-03-1994	FI	924060 A		11-03-1994
			AT	186801 T		15-12-1999
			AU	676205 B		06-03-1997
			AU	4962393 A		29-03-1994
			DE	69327058 D		23-12-1999
			DE	69327058 T		25-05-2000
			DK	659316 T		13-03-2000
			EP	0659316 A		28-06-1995
			ES	2139018 T		01-02-2000
			JP	8501421 T		13-02-1996
			US	6032042 A		29-02-2000
<hr/>						
WO 9837721	A	27-08-1998	FI	970705 A		20-08-1998
			FI	980351 A		20-08-1998
			AU	6216398 A		09-09-1998
			CN	1251249 T		19-04-2000
			EP	0962113 A		08-12-1999
			ZA	9801325 A		08-09-1998
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REC'D 20 SEP 2001

WIPO PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference M.COSTA 9-9-6-8	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP00/05707	International filing date (day/month/year) 20/06/2000	Priority date (day/month/year) 20/08/1999
International Patent Classification (IPC) or national classification and IPC H04Q7/38		
Applicant LUCENT TECHNOLOGIES INC.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 6 sheets, including this cover sheet.

- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of three sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 11/11/2000	Date of completion of this report 18.09.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Aguilar Cabarrus, E Telephone No. +49 89 2399 7524 

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP00/05707

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1,4-12	as originally filed			
2,3	as received on	07/07/2001	with letter of	05/07/2001

Claims, No.:

1-6	as received on	07/07/2001	with letter of	05/07/2001
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Drawings, sheets:

1/4-4/4	as originally filed
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2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP00/05707

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-6
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-6
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-6
	No:	Claims	

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

Reference is made to the following document:

D1: WO 98 37721 A

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. The present invention relates to a **packet switched network architecture** according to the preamble of **claim 1**.
2. During the introduction of the Universal Mobile Telecommunications System (UMTS), the UMTS radio coverage is expected to be limited to urban areas. Even within UMTS coverage areas, the UMTS radio coverage cannot be expected to be contiguous. This will result in small pockets (such as inside buildings) without UMTS coverage within the overall UMTS coverage area. Thus, only GSM radio coverage will be available in these pockets. Various **systems** for providing a technique suitable for use in a **network architecture** in which **more than one type of core network** is provided are **known in the art**.

Document **D1** describes a packet switched network architecture having a first location area associated with a first core network and a second location area associated with a second core network, each of the core networks having a dedicated mobility management, wherein at least a portion of the first and second location areas overlap thereby forming a common location area, the common location area being connected to the first and second core networks by a common radio access network. A subscriber terminal sends to the radio access network only one location updating message irrespective of how many core networks have a simultaneously changing location area at a handover from one cell to another. On the basis of the information contained in the location updating message, a location updating message informing the new location of the subscriber is sent separately to the core networks to which the location updating applies.

3. A main **disadvantage** related to the known packet switched network architecture is

that a translation has to be made of the Location Area Identification (LAI) included in the sent location updating message into the different LAIs of the rest of the core networks.

4. The **present invention** overcomes this problem by providing a **packet switched network architecture** according to the characterizing features of **claim 1**.

According to the **essential features of the invention**, the common location area is associated with a **location area identifier value common to both core networks** which includes a **core network identifier field** having a value to **distinguish** between the **core networks**.

5. The present invention provides the **advantage of reduced processing** since the LAI received by the common access network does not have to be translated to the different LAIs of the rest of the core networks.
6. The **subject-matter** of the present invention as claimed in claims 1 is neither disclosed in, nor rendered obvious by the remaining **prior art documents** cited in the international search report since said documents do **not** describe the packet switched network architecture according to the particular feature combination of the present invention or part thereof as defined in claim 1.
7. The subject-matter of **claim 1** is, therefore, considered to be **new** and to involve an **inventive step**, Articles 33(2) and (3) PCT.
8. As **claims 2 to 6** are dependent on claim 1, said **claims 2 to 6** do **also meet** the requirements of Articles 33(2) and (3) PCT.
9. The present invention is **susceptible of industrial application**, Article 33(4) PCT.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP00/05707

Re Item VII

Certain defects in the international application

The feature described in the summary of the invention (page 3, lines 3-4) "The common location area.." is already included in present **claim 1** (see page 2, lines 18-19) and should have been, therefore, deleted of the opening part of the description presenting the optional features.

Thus as a dual mode mobile terminal moves around within radio access areas, changes in the type of radio access can be expected as the available radio access systems change. As the mobile terminal moves between radio access areas routing area updates occur to notify the necessary support
5 network of the new position of the mobile in the routing area associated with the particular radio access type. Changing between two radio access systems involves additional signalling and can also lead to outages during the transition between the two systems. The impact of the additional signalling and outages depends on the network architecture and the
10 protocols chosen.

In addition, if a mobile terminal operating in the 3G mode of operation moves out of 3G coverage, then there is a consequential degradation in service when communication with the 2G core network is established.

It is an object of the present invention to provide a technique suitable for
15 use in a network architecture in which more than one type of core network is provided.

.7 Summary of the Invention

According to the present invention there may be provided a packet switched network architecture having a first location area associated with
20 a first core network and a second location area associated with a second core network, wherein at least a portion of the first and second location areas overlap thereby forming a common location area, the common location area being associated with a location area identifier common to both the first and second core networks, the location area identifier
25 additionally including a core network identifier field having a value to distinguish between the first and second core networks.

The radio access network associated with the first location area may use the value in the location area identifier to direct packet transmission from mobile terminals in the common location area to one of the first and
30 second core networks.

The first and second core networks may have the same functionality.

The first and second core networks may have different functionality.

The common location area may be connected to the first and second core networks by a common radio access network.

- 5 The common location area may be connected to the first and second core networks by first and second radio access networks.

The first and second radio access networks may correspond to the respective functionality of the first and second core networks.

The value in the location area identifier may be a single bit.

- 10 The value in the location area identifier may be a range of values.

The invention will now be described by way of example with reference to the accompanying drawings, in which:

Brief Description of the Drawings

- 15 Figure 1 illustrates the patchy nature of UMTS radio coverage in a GSM coverage area;

Figure 2 illustrates a network architecture for the proposed introduction of 3G services in an existing 2G environment;

Figure 3 illustrates a modified network architecture for the proposed introduction of 3G services in an existing 2G environment;

- 20 Figures 4(a) and 4(b) illustrate location area identifiers for distinguishing between core networks servicing common location areas; and

Figure 5 illustrates a network architecture in which parallel core network resources of the same functionality are used to support a single location area.

- 25 **Description of Preferred Embodiment**

The present invention will be described hereinafter by way of reference to the particular non-limiting example of the deployment of a 3rd Generation (3G) mobile system alongside a 2nd Generation (2G) mobile system. In the particular example the 2G system is a GSM/GPRS system, and the 3G

Claims

1. A packet switched network architecture having a first location area associated with a first core network and a second location area associated with a second core network, wherein at least a portion of the first and second location areas overlap thereby forming a common location area, the common location area being associated with a location area identifier common to both the first and second core networks, the location area identifier additionally including a core network identifier field having a value to distinguish between the first and second core networks.
2. The packet switched network of claim 1 wherein the radio access network associated with the first location area uses the value in the location area identifier to direct packet transmission from mobile terminals in the common location area to one of the first and second core networks.
3. The packet switched network of claim 1 or claim 2 in which the first and second core networks have the same functionality.
4. The packet switched network of claim 1 or claim 2 in which the first and second core networks have different functionality.
5. The packet switched network of any preceding claim in which the common location area is connected to the first and second core networks by a common radio access network.
6. The packet switched network of any preceding claim in which the common location area is connected to the first and second core networks by first and second radio access networks.
7. The packet switched network of claim 6 when dependent on claim 4, in which the first and second radio access networks correspond to the respective functionality of the first and second core networks.

8. The packet switched network of any one of claims 1 to 7 wherein the value in the location area identifier is a single bit.
9. The packet switched network of any one of claims 1 to 7 wherein the value in the location area identifier is a range of values.